of October, during the passage of an extensive depression on the west side of the Danish Islands and moving to the northwest. The wind from west-northwest that blew at Frederiksted from 10 to 1 that night and did some damage to the small craft there, was probably a part of that minor movement.

The details given in Captain Dix's notes are very interesting and they show that the stormy weather struck the several islands from St. Kitts to Dominica *about the same time*. If we run a line out from the assumed position of the cyclone's center on Tuesday night at right angles to its track and going south-southeast, we shall find that it passed west of the islands, which will lie, roughly speaking, parallel to it. It seems that the whole southeast quadrant of the cyclone was stormy, but was most so in the neighborhood of that line, on the passing of which all of the islands affected were, in fact, at about their nearest to the center. After that had passed and the southwest quadrant was entered, the wind, though maintaining its cyclonic movement, fell to mild westerly breezes. Why it did so is an interesting speculation, but here we only note the fact. Later on information from the different islands may throw further light on the whole subject, but we think that, in the main, the theory given above in our article will be sustained.

POPULAR ARTICLES REQUESTED.

It is doubtless known to many of our readers that the beautiful magazine, St. Nicholas for Young Folks, has for several years devoted a few pages to a department of nature and science, in which occasionally we find something bearing on the weather or the atmosphere. The editor has recently appealed to us for further contributions "on some weather phenomenon of instruction and entertainment to young folks." A similar request has also been received from the editor of the Youths' Companion. We believe we can not do better for the general cause of meteorology than to urge that those who are gifted in writing such sprightly articles as are acceptable to these magazines send their efforts to the St. Nicholas Magazine, Century Company, Union Square, New York City, or to The Youths' Companion, Boston, Mass., so as to make sure that meteorology and its interesting atmospheric phenomena are brought home to the attention of their readers.

BLACK RAIN IN CLERMONT COUNTY, OHIO, AUGUST 19, 1903.

Mr. J. Warren Smith, Section Director, Columbus, Ohio, has forwarded some samples of black rain, collected by Dr. Julius D. Abbott, of Bethel, Ohio, which fell on August 19, 1903, and was the third black rain that had occurred this year. Dr. Abbott says that the creeks and even the furrows in the fields were full of this black water, but the sample that he sends the Weather Bureau was taken out of a perfectly clean porcelain kettle. He states that the black coloring substance does not settle but gives the water a permanent inky appearance. It leaves a black scum on the creek banks and on the grass. A similar description of the rain was received from Daniel Bohl, at Laurel, Clermont County, Ohio.

Samples of the dust from black rains have often been examined microscopically and chemically. An elaborate report of this kind will be found in the MONTHLY WEATHER REVIEW for January, 1895. It seemed likely that a physical examination of the dust and a determination of the size of the particles would be especially interesting in the present case, as Dr. Abbott's sample evidently represented the finest dust of which the great beds of loess are formed. The sample was, therefore, sent to Prof. Milton Whitney, Chief of the Bureau of Soils, who reports as follows:

The material in suspension was found to be completely floculated when the sample was received and would soon settle to the bottom of the vial, even after being violently agitated. The addition of a small amount of ammonia to a part of the sample served to break the floculation, and a microscopic examination of this material showed that it was, for the most part, exceedingly fine, many of the particles being less than one-thousandth of a millimeter in diameter. There were, however, a few transparent crystalline particles which were probably quartz. The vial when first opened emitted a strong odor of hydrogen sulphide. This fact, together with the microscopic examination, leads me to believe that the material is probably extremely fine soil with a considerable portion of organic matter, as Mr. Smith has suggested.

The explanation offered by Mr. Smith is as follows:

These two places are in southern Clermont County, east of a long bend in the Ohio River. I shall be glad to know whether my theory that this "black rain" is the dust blown up in the outrushing squall in advance of the thunderstorm is considered a satisfactory one. The Ohio River must be low at this point and the long drought must have dried the black mud deposit on the river banks into dust so that it would be easily blown high into the air, to be deposited 15 or 20 miles to the east."

We see no reason to doubt the general correctness of Mr. Smith's explanation.

VERTICAL COMPONENTS OF ATMOSPHERIC MOTIONS.

The following passage occurs in a sentence lately examined by the Editor:

The cold, dry air, going off in all directions during a cold wave is not alone due to the temperature of the subarctic regions translated eastward and southward by the general circulation, but equally to the vortical action that is going on within the great anticyclone; a process whereby the cold of the upper air levels is brought down, proving a potent factor in augmenting the cold conditions of the lower strata.

The preceding sentence seems to imply that the cold air of the higher levels, when brought down to the earth's surface, retains its low temperature and augments the cold already prevailing in the lower strata. Does not this simple theory require careful examination? We have actual observations of the temperature of the upper air that give us something like a reliable basis for a computation on this matter. We copy from the MONTHLY WEATHER REVIEW for April, 1901, page 177, the following table, showing the mean temperatures by months, at high altitudes, on days when observations could be obtained by Leon Teisserenc de Bort, at Trappes, near Paris, by means of sounding balloons during 1898, 1899, and 1900:

TABLE 1.—*Mean temperatures.*

Month.	Paris.			Winnipeg.	
	On the ground.	At 5000 meters.	At 10,000 meters.	On the ground.	At 10,000 meters.
	° C.	° C.	° C.	° C.	° C.
January	5.4	—15.3	—47.6	—21	—74
February	1.0	—21.8	—53.4	—19	—73
March	0.9	—20.9	—53.7	—10	—65
April	5.3	—18.4	—49.3	3	—52
May	7.0	—16.8	—51.3	11	—47
June	14.2	— 8.8	—45.3	17	—42
July	15.7	— 8.7	—44.5	20	—40
August	17.8	— 7.2	—41.8	18	—42
September	13.4	— 9.7	—47.9	12	—49
October	10.2	—11.0	—45.1	4.5	—50
November	3.8	—12.8	—45.2	— 6.5	—55
December	0.9	—18.9	—52.4	—16	—69

It will be seen from this table for the latitude of Paris (which is about 48° 15′ north, and corresponds with the latitude of Manitoba), that on these special days the air at 10,000 meters altitude has, for instance, in March, an average temperature of —53.7° C., but of 0.9° at sea level. Now, the charts of mean monthly isotherms for North America give —10° C. for sea level at Winnipeg, in Manitoba, at about the same latitude and other temperatures as shown in the 5th column of Table 1. But these latter figures represent the average of the whole month and not of any special days, such as those on which balloon ascensions can be made; doubtless the averages for balloon work at Winnipeg would be higher than these, because the coldest weather is unfavorable for such work. However, the Paris observations give us a basis for estimating the rate of decrease of temperature with altitude, thus, in March, the temperature at 10,000 meters is 52.8° C. below that at the ground. If we apply the similar differences month by month to Winnipeg we get some idea as to what the average temperature may be at 10,000 meters above Manitoba, and the result is given in the last column of Table 1.

Now, the above explanation of the origin of the cold air in a